ORIGOmath Grades 1 – 6

A Step-by-Step Approach to Computation

ORIGOmath is a real alternative for those seeking a better way to teach computation. This carefully sequenced program draws on a range of visual models and concrete materials with appropriate practice to develop skills in all aspects of computation.

Scope and Sequence

Number

Integers

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
• Use a number track to assist with counting and ordering. • Represent 2-digit numbers using numerals, words, concrete materials, and pictures. • Combine materials and finger groupings into tens and ones to represent 2-digit numbers. • Read and write 2-digit numbers with pictures and a numeral expander. • Use coins to represent 2-digit amounts (multiples of 5 cents). • Count forward and back by tens on and off the decade. • Count forward and back by 2 and 5. • Use number tracks and hundred charts to assist with counting and ordering. • Count forward and back by ones from a given 2-digit number. • Identify the number before and after a given 2-digit number. • Read and write 2-digit numbers. • Use place value to build 2-digit numbers.	• Read and write hundreds. • Use pictures to write 3-digit numbers (easy examples, then numbers with tens and zeros). • Read and write 3-digit numbers without pictures. • Use a number line to develop relative position for 2- then 3-digit numbers. • Use place value to build numbers. • Read and write amounts in dollars and cents. • Use a number line to locate nearby hundreds.	• Read and write 4-digit numbers without pictures. • Locate 3- then 4-digit numbers on a number line. • Use a range of representations to analyze whole numbers and fractions. • Develop relative position for 3- then 4-digit numbers. • Use place value to build numbers. • Read and write amounts in dollars and cents. • Use a number line to locate nearby hundreds then thousands.	• Read and write 4- then 5-digit numbers. • Locate 4- then 5-digit numbers on a number line. • Extend counting strategies. • Compare, order, and sequence 4-digit numbers. • Use a number line to locate nearby whole numbers or tenths.	• Read and write 5- then 6-digit numbers. • Locate 5- then 6-digit numbers on a number line. • Compare, order, and sequence 5- then 6-digit numbers. • Reinforce relative position. • Round to nearest whole number or tenth.	• Read and write whole numbers from an everyday situation. • Locate integers on a number line. • Compare, order, and sequence integers. • Reinforce relative position.

Decimals and Fractions

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
			• Read and write common fractions. • Explore equivalence of common fractions. • Find halves and quarters of collections. • Use a range of representations (whole numbers and fractions). • Divide by 2 or 4 to find halves and quarters of 2-digit numbers. • Use an area model to work with halves and quarters. • Read and write decimals to hundredths. • Locate tenths and hundredths on a number line. • Compare and order tenths and hundredths. • Relate common and decimal fractions. • Use a number line to locate nearby whole numbers or tenths.	• Relate common fractions and decimals (number lines and area). • Read and write decimals to thousandths. • Locate tenths, hundredths, and thousandths on a number line. • Relate tenths, hundredths, and thousandths. • Work with percentage. • Relate key percentage to fractions. • Locate hundredths on a number line and find a nearby tenth. • Compare and order thousandths. • Use the number line to relate fractions (proper and improper forms). • Work with equivalence. • Add/subtract common fractions with same denominators.	• Read and write decimals to thousandths. • Locate tenths, hundredths, and thousandths on a number line. • Relate tenths, hundredths, and thousandths. • Relate percentages to common and decimal fractions. • Use rules to find equivalent fractions. • Simplify fractions. • Compare and order rational numbers. • Adjust numbers to any useful place. • Locate decimals on a number line. • Use the number line to relate fractions (proper and improper forms). • Extend work with the relationship between common and decimal fractions. • Formalize equivalence of percentage, and common and decimal fractions.

Addition and Subtraction

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
• Solve active and static addition problems. • Use the "+" and "–" symbols. • Establish the turnaround concept. • Record take-away situations with subtraction number sentences. • Relate part-part-total to subtraction. • Use a count-on strategy to add. • Use a doubling strategy to add. • Use a bridge-to-10 strategy to add. • Relate missing addend and comparison situations to subtraction. • Write fact families (count-on/back). • Extend the count-on strategy beyond facts (1 or 2 and then 10 or 20). • Extend the count-back strategy beyond facts (1 or 2 and then 10 or 20). • Extend the addition doubling strategies to multiples of 5 and then teen numbers. • Add and subtract 2-digit numbers on the hundred chart. • Use the count-on/back strategy to add/subtract 10 or 20 cents.	• Relate operations. • Write related facts (use-doubles, then bridge-to-10 facts). • Use extended count-on strategy. • Use extended count-back strategy. • Extend use-doubles strategy to 2-digit numbers. • Use place value to add 2-digit numbers (without, then with bridging). • Use a nearby ten to add 2-digit numbers. • Write fact families. • Use an empty number line to model strategies for addition and subtraction. • Use reference points to add/subtract.	• Extend the count-on/back strategies with 2- and 3-digit numbers. • Write related facts (use-doubles, then bridge-to-10 facts). • Reinforce and extend use-doubles strategy to add 2-digit numbers. • Use addition (count-on strategy) to subtract 2-digit numbers. • Use place value to add/subtract 2- and 3-digit numbers. • Use a nearby ten to add numbers. • Use a known subtraction fact to subtract 3-digit multiples of 10. • Use reference points to add/subtract 3-digit numbers. • Adjust numbers to add/subtract. • Use the count-on/back strategy to subtract 3-digit numbers (with and without bridging). • Use the round-and-adjust strategy to subtract. • Use magic squares to motivate the use of mental strategies. • Use the algorithm for addition and subtraction when mental computation is too difficult.	• Use count-on, place-value, and round-and-adjust strategies to add whole numbers. • Find compatible pairs to add. • Use the round-and-adjust strategy to add/subtract. • Use the place-value strategy to add/subtract. • Use written methods to add/subtract 3-digit numbers. • Use the count-on/back strategies to subtract 2- and 3-digit numbers. • Use reference points to add/subtract 3-digit numbers. • Adjust numbers to add/subtract. • Count on from an amount of coins to a dollar-and-cent amount. • Calculate change from any coin amount.	• Use a range of strategies to add/subtract 3- and 4-digit numbers and tenths. • Use compatible pairs to add. • Use the round-and-adjust strategy to add/subtract tenths, hundredths, and dollars and cents. • Use place-value and count-on strategies to subtract whole numbers, tenths, and dollars and cents. • Continue to use a range of strategies to add or subtract whole numbers mentally. • Add more than 2 addends. • Add and subtract decimals (tenths then hundredths). • Solve problems involving money. • Count on from an amount of coins to a dollar-and-cent amount. • Calculate change from any coin amount. • Use reference points to add/subtract. • Adjust numbers to add/subtract. • Add/subtract common fractions with same denominators.	• Reinforce the use of multiple strategies to add/subtract manageable whole numbers and decimals. • Use the round-and-adjust strategy to add/subtract tenths, hundredths, and dollars and cents. • Use place-value and count-on strategies to subtract whole numbers, tenths, and dollars and cents. • Record steps to add/subtract whole numbers and decimals. • Use multiple strategies to add/subtract whole numbers and decimals. • Add/subtract common fractions. • Solve problems involving money.

Multiplication and Division

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
No content in Grade 1.	• Use language of equal groups and arrays. • Relate the "×" and "÷" symbols to equal groups and arrays. • Use the turnaround concept to write related facts. • Count by 2s, 5s, and 10s. • Use tens to multiply by 5. • Use the turnaround concept to help learn facts. • Use doubling to multiply by 2. • Use the double-double strategy to multiply by 4. • Use materials to divide by 2, 4, or 5. • Interpret remainders. • Relate division to fractions. • Relate division to multiplication. • Write related facts.	• Relate the "×" symbol to equal groups, an array, and the set model. • Write related turnaround facts. • Extend the doubling strategy to 2-digit numbers. • Multiply 2-digit numbers by 10 then 5. • Use the double-double then the double-double-double strategies to multiply by 4 and 8. • Use the build-down strategy (9s facts) and then the build-up strategy (6s facts). • Extend the build-down and build-up strategies to 2-digit numbers. • Use the doubling-and-halving strategy to multiply. • Use place value to multiply. • Solve division problems. • Relate halves and quarters to divide by 2 and 4. • Work with remainders. • Relate division to fractions. • Relate division to multiplication. • Find a missing factor. • Write fact families (2s and 5s facts).	• Use a known fact or factors to multiply. • Multiply with 3 factors. • Use the "think multiply" strategy to divide. • Write fact families (4s, 6s, 8s, and 9s facts). • Extend the doubling-and-halving strategy. • Work with remainders. • Multiply 2-digit by 2-digit numbers. • Use place value to multiply by a 1-digit number. • Reinforce the "think multiply" strategy to divide. • Use the doubling-and-halving strategy to multiply. • Use halving to divide by 4. • Use place value to divide 2- then 3-digit numbers. • Use the break-up strategy to divide. • Record steps to multiply/divide (whole numbers and dollars and cents).	• Use compatible factors to multiply. • Use factors to multiply. • Extend the doubling-and-halving strategy. • Use place value to multiply whole numbers or dollars and cents by a 1-digit number. • Use place value to divide. • Use patterns to multiply/divide. • Use the double-double strategy to multiply. • Use fractions to multiply. • Round and adjust to multiply. • Multiply by multiples of 10. • Use the break-up strategy to divide. • Calculate rate (distance/price). • Calculate best buys. • Record steps to multiply/divide (whole numbers and dollars and cents).	• Extend the use of compatible factors to multiply. • Extend build-up/down strategies (× 19, × 21, etc.). • Use place value to multiply by a 2-digit number. • Solve problems involving key percentages. • Formally relate multiplication of unit fractions to division. • Record steps to multiply/divide whole numbers. • Use a place value strategy to divide. • Round and adjust to multiply. • Solve percentage problems. • Break up the dividend to divide. • Calculate rate (speed/price). • Work with ratio problems. • Calculate best buys. • Use models to multiply and divide common fractions.

Algebra

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
• Explore relationship rules. • Express addition or subtraction in equation form. • Use the "=" symbol. • Work with the concepts of "less than," "greater than," and "not equal." • Record relationship rules for addition and subtraction. • Write related addition/subtraction facts. • Use a balance situation to relate addition and subtraction and write equations.	• Develop relationship rules. • Record input-output data (addition and subtraction). • Use equations to record addition/subtraction situations. • Write related addition and subtraction facts. • Use addition to reverse subtraction. • Use a balance situation to relate addition and subtraction and write equations. • Use addition to subtract 2-digit numbers.	• Multiply by 1 then 0. • Investigate multiplication patterns (9s facts). • Record input-output data (addition and subtraction). • Develop relationship rules for multiplication and division. • Record input-output data (multiplication and division). • Use equations to record operations. • Write related multiplication and division facts. • Use addition to reverse subtraction. • Extend relationship rules for multiplication and division. • Use a balance situation to relate addition and subtraction and write equations. • Use addition to subtract 2- and/or 3-digit numbers.	• Use equations to record any of the 4 operations. • Write related multiplication and division facts. • Reinforce connection between multiplication and division. • Record input-output data (multiplication and division). • Investigate patterns/rules with 2 operations. • Use the inverse operation. • Apply the commutative, associative, distributive, and identity properties.	• Use equations to record any of the 4 operations. • Write related multiplication and division facts. • Apply properties of operations and use parentheses. • Reinforce relationship rules for multiplication and division. • Record input-output data (multiplication and division). • Describe then write a relationship rule as an equation. • Investigate patterns/rules with 2 operations. • Use the inverse operation.	• Write equations with 2 or more operations. • Work with unknowns. • Record input-output data (multiplication and division). • Reverse a rule (1 or 2 operations). • Explore strategies to solve equations (balance, guess and check, use inverse operation). • Write rules to describe relationships between 2 sets of data. • Apply properties of operations and use parentheses.

ORIGOmath Components

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
 Teacher Sourcebook Student Journal Computation Practice	 Teacher Sourcebook Student Journal Computation Practice	 Teacher Sourcebook Student Journal Computation Practice	 Teacher Sourcebook Student Journal Computation Practice	 Teacher Sourcebook Student Journal Computation Practice	 Teacher Sourcebook Student Journal Computation Practice

ORIGO Support Resources

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Fundamentals (Yellow) *Mathematicals (Book 1)* *Algebra for All (Yellow)* *The Book of Facts: Addition* *The Book of Facts: Subtraction* *The Box of Facts: Addition and Subtraction*	*Fundamentals (Orange)* *Mathematicals (Book 2)* *Algebra for All (Orange)* *The Book of Facts: Addition* *The Book of Facts: Subtraction* *The Book of Facts: Multiplication* *The Box of Facts: Addition and Subtraction* *The Box of Facts: Multiplication and Division*	*Fundamentals (Purple)* *Mathematicals (Book 3)* *Algebra for All (Purple)* *The Book of Facts: Addition* *The Book of Facts: Subtraction* *The Book of Facts: Multiplication* *The Book of Facts: Divison* *The Box of Facts: Addition and Subtraction* *The Box of Facts: Multiplication and Division*	*Fundamentals (Green)* *Mathematicals (Book 4)* *Algebra for All (Green)* *The Book of Facts: Multiplication* *The Book of Facts: Divison* *The Box of Facts: Multiplication and Division*	*Fundamentals (Red)* *Mathematicals (Book 5)* *Algebra for All (Red)* *The Book of Facts: Multiplication* *The Book of Facts: Divison*	*Fundamentals (Blue)* *Mathematicals (Book 6)* *Algebra for All (Blue)*

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